

## PATENT COOPERATION TREATY

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference ACA 6316 P1-WO	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. PCT/EP2004/008008	International filing date (day/month/year) 16.07.2004	Priority date (day/month/year) 24.07.2003
International Patent Classification (IPC) or national classification and IPC C11C3/14, C11C3/00, B01J29/00, C07C51/353		
Applicant AKZO NOBEL N.V.		
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 9 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>		
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input checked="" type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input checked="" type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>		
Date of submission of the demand  24.01.2005	Date of completion of this report  12.07.2005	
Name and mailing address of the international preliminary examining authority:   European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer  Rooney, K  Telephone No. +31 70 340-	



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**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

**Description, Pages**

1-30 as originally filed

**Claims, Numbers**

1-30 as originally filed

- ☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability**

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1. The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non-obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 26, 27

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination (specify):

☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. are so unclear that no meaningful opinion could be formed (*specify*):

☐ the claims, or said claims Nos. are so inadequately supported by the description that no meaningful opinion could be formed.

☒ no international search report has been established for the said claims Nos. 26, 27

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form

☐ has not been furnished

☐ does not comply with the standard

the computer readable form

☐ has not been furnished

☐ does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

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**Box No. IV Lack of unity of invention**

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1. ☒ In response to the invitation to restrict or pay additional fees, the applicant has:
- ☐ restricted the claims.
  - ☐ paid additional fees.
  - ☐ paid additional fees under protest.
  - ☒ neither restricted nor paid additional fees.
2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose, according to Rule 68.1, not to invite the applicant to restrict or pay additional fees.
3. This Authority considers that the requirement of unity of invention in accordance with Rules 13.1, 13.2 and 13.3 is
- ☐ complied with.
  - ☒ not complied with for the following reasons:  
**see separate sheet**
4. Consequently, this report has been established in respect of the following parts of the international application:
- ☐ all parts.
  - ☒ the parts relating to claims Nos. 1-25,28-30 .

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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1. Statement

Novelty (N)	Yes: Claims	1-25, 30
	No: Claims	28-29
Inventive step (IS)	Yes: Claims	
	No: Claims	1-25,28-30
Industrial applicability (IA)	Yes: Claims	1-25,28-30
	No: Claims	

2. Citations and explanations (Rule 70.7):

**see separate sheet**

**Re Item IV.**

The separate inventions are:

**1) Claims 1-25,28-30**

A process for alkylation and isomerisation of unsaturated linear fatty acids and/or alkyl esters to their branched aryl counterparts using acid zeolite catalysts.

**2) Claims 26-27**

A process for alkylation and isomerisation of unsaturated linear fatty acids and/or alkyl esters to their branched aryl counterparts using acid metal oxide catalysts

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

Invention 1 consists of a process for alkylation and isomerisation of unsaturated linear fatty acids and/or alkyl esters to their branched aryl counterparts.

It has the technical features of subjecting a feedstock containing these fatty acids and an aromatic compound to an alkylation and isomerisation reaction in the presence of at least one acidic zeolite catalyst.

Invention 2 consists of a process for alkylation and isomerisation of unsaturated linear fatty acids and/or alkyl esters to their branched aryl counterparts.

It has the technical features of subjecting a feedstock containing these fatty acids and an aromatic compound to an alkylation and isomerisation reaction in the presence of at least one acid metal oxide catalyst.

The special technical feature in the sense of Rule 13 PCT which links the subject-matter of the different inventions is the use of an acidic catalyst to achieve the alkylation and isomerisation.

However, this feature is known from the following documents:

The document US5840942 discloses the use of acid clay catalyst in a process for

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alkylation and isomerisation of unsaturated linear fatty acids and/or alkyl esters to their branched aryl counterparts (see column 5, paragraph 2 and claim 1).

The document US5440059 discloses the use of acid clay catalyst in a process for alkylation and isomerisation of unsaturated linear fatty acids and/or alkyl esters to their branched aryl counterparts (see column 4, paragraph 4 and claim 1)

The document US5034161 discloses the use of acid resin catalyst in a process for alkylation and isomerisation of unsaturated linear fatty acids and/or alkyl esters to their branched aryl counterparts (see claim 1).

The application therefore is divided into 2 groups of inventions, each defining different catalytic compounds which differ in their structure and provide alternative solutions to the problem underlying the application.

**Re Item V.**

1 The following documents are referred to in this communication: . . .

D1: US-A-5 840 942 (OUDE ALINK BERNARDUS A) 24 November 1998 (1998-11-24)

D2: US-A-5 440 059 (ALINK BERNARDUS A O) 8 August 1995 (1995-08-08)

D3: US 2003/100780 A1 (STEICHEN DALE ET AL) 29 May 2003 (2003-05-29)

D4: US-A-5 034 161 (ALINK BERNARDUS A O) 23 July 1991 (1991-07-23)

2 Novelty

The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 28 and 29 is not new in the sense of Article 33(2) PCT.

The document D2 discloses a process for manufacturing an aryl branched fatty acid, namely xylyl stearate (see D1: example 1).

The document D2 discloses a process for preparing an aryl branched fatty acid, namely

xylyl stearate (see D2: claim 1).

The document D4 discloses a process for preparing an aryl branched fatty acid, namely tolyl stearate (see D4: example 1).

### 3 Inventive Step

The document D2 which is considered the closest state of the art to the subject-matter of claim 1 discloses a process for the alkylation and isomerisation of unsaturated linear fatty acids and/or alkyl esters to their branched counterparts which comprises subjecting a feedstock to an alkylation and isomerisation reaction in the presence of a zeolite catalyst, wherein the feedstock comprises unsaturated fatty acids such as oleic acid and also aromatic compounds such as xylene (see D1: example 1).

The subject-matter of claims 1, 13 and 20 differs from the teaching of the document D1 in that the zeolite is specified as being a) of the acidic type with ring structures of at least 10 members, b) of a type comprising a mesoporous crystalline phase with pore walls containing primary and secondary crystalline building unit structures and c) of a type comprising a one metal ion exchanged catalyst having at least one non-zero valent metal ion. However, these type of zeolites are already known to participate in isomerisation reactions of unsaturated linear fatty acids (see D3: column 3, paragraph 5; column 5, paragraphs 3-4 and examples 1-3).

Therefore it appears that specifying the use of these forms of zeolite in this reaction is an option which would be readily considered by those skilled in the art. Furthermore, the application does not contain any description of surprising or special effects conferred on the reaction by the selection of this known alternative catalyst. Therefore it appears that the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 13 and 20 does not involve an inventive step in the sense of Article 33(3) PCT.

### 4 Dependent Claims

Claims 2-12, 14-19, 21-25 and 30 do not confirm to the PCT with respect to inventive step as they contain specifications for reactants e.g. oleic acid and xylene or toluene (see D1 and D3: above citations) or further details relating to the catalyst (see D3: above citations) which are already disclosed in connection with the reaction which is the

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subject of this application.